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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,169	04/17/2006	Takeaki Saiki	71051-008	9218

27305 7590 03/26/2010
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Royal Oak, MI 48067

EXAMINER

DOLLINGER, MICHAEL M

ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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03/26/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/533,169	Applicant(s) SAIKI ET AL.	
	Examiner MIKE DOLLINGER	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ely (US 3,925,331).
2. Ely discloses a moisture curable sealant composition which comprises the product of reacting under anhydrous conditions a polysulfide of the formula



with a silane of the formula $\text{Q}_n\text{SiX}_{4-n}$ where n is 1 or 2, Q is an organic groups which may be $\text{CH}_2=\text{CR}_{15}$ - C_mH_{2m} -, and at least 2 X are organic hydrolyzable groups and the remaining X (if any) is C_{1-6} alkyl or chloroalkyl [abstract]. When the Q group in the silane is of formula $\text{CH}_2 = \text{CH}(\text{CH}_2)_m$ e.g. as in vinyl triethoxysilane or vinyl ethyl dimethoxy (or diethoxy) silane, 3-10% of the SH groups of polysulphides of molecular weight 4,000-10,000 can be reacted by heating for 8-25 hr at 80-120°C with an amount of silane in the molar ratio to thiol in the polysulphide of 0.5 : 1 to 1.5 : 1. Addition of 0.001-3% by weight of catalyst e.g. an amine such as pyridine or sulphur enhances the amount of addition under otherwise identical conditions [column 6 lines 4-13]. In Example 14, for instance, Ely discloses a process wherein (B) 0.05mol of a polymer of the formula



was mixed with 500ml toluene and the mixture was boiled under reflux to remove water [column 17 lines 35-42] to achieve an inert environment and to this solution was added (D) 2.5g of sulfur (0.078mol) and (A) 0.17mol of vinylmethyldimethoxysilane [column 17 lines 42-45]. If pyridine was added as a catalyst as well, it would be included in an amount of 0.001-3% by weight of the composition which corresponds to 0.05 to 15.8 g or pyridine equal to 0.00067 to 0.2mol pyridine. Pyridine reads on a monoarylamine.

3. Ely does not disclose a process wherein both a nitrogen containing base and sulfur are mixed with claimed components (A) and (B). However, Ely does disclose that both pyridine (a nitrogen containing organic base) and sulfur may be used as catalysts for the reaction of (A) and (B) [column 6 lines 12-13].

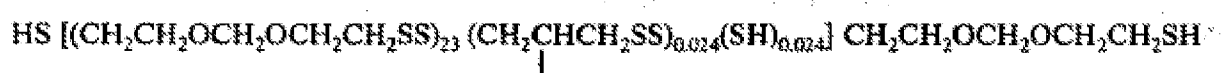
4. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have prepared a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur because Ely teaches that it is within the skill of the art to prepare a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide and Ely also teaches that it is within the skill of the art to catalyze the reaction with pyridine or elemental sulfur. One would have found it obvious to use both elemental sulfur and pyridine as the catalyst because Ely teaches that they are functional equivalents for this purpose and it is *prima facie* obvious to combine two composition each of which is taught by the prior art to be

useful for the same purpose, in order to form a third composition to be used for the very same purpose. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA). Absent any evidence to the contrary, there would have been a reasonable expectation of success in mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur.

5. Regarding claim 9, Examiner has calculated the claimed mole percents of Example 14 of Ely that are required by claim 9 and found that (B) is used in an amount of 29.4 mol% of (A), (C) is used in an amount of 0.4 to 117 mol % of (A), and (D) is used in an amount of 3.1 mol % of (S_yR³) repeating units in (B). The disclosed range of mol% of (C) overlaps the claimed range of 0.01 to 10 mol%. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 1911 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

6. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al (US 4,096,131) in view of Ely (US 3,925,331).

7. In Example 9, Price et al disclose a process of forming a silyl containing polysulfide polymer by mixing (B) a polysulfide of the formula [column 13 line 1]



Art Unit: 1796

with (D) 25 g of sulphur and (A) 150 g of methylvinyl dimethoxysilane under an atmosphere of nitrogen and vacuum at 100°C [column 15 lines 39-45].

8. Price et al do not disclose a process wherein a nitrogen containing organic base is mixed with components (A), (B) and (D).

9. Ely, discussed above, discloses that both pyridine (a nitrogen containing organic base) and sulfur may be used as catalysts for the reaction of (A) and (B) [column 6 lines 12-13]. Ely teaches, henceforth, that pyridine and sulfur are functionally equivalent for the purpose of catalyzing the reaction of (A) and (B). Ely also teaches that pyridine and sulfur should be included in 0.001 to 3% by weight [column 6 lines 12-13]. Pyridine reads on a monoarylamine.

10. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have prepared a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur because Price et al teach that it is within the skill of the art to prepare a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide and sulfur and Ely teaches that it is within the skill of the art to catalyze the reaction of a vinyl silane and a mercapto terminated polysulfide polymer with pyridine or elemental sulfur. One would have been motivated to use both elemental sulfur and pyridine as the catalyst in the process of Price et al because Ely teaches that they are functional equivalents for this purpose and it is *prima facie* obvious to combine two composition each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for

Art Unit: 1796

the very same purpose. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA). Absent any evidence to the contrary, there would have been a reasonable expectation of success in mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur.

11. Regarding claim 9, Examiner has calculated the claimed mole percents of Example 9 of Price et al that are required by claim 9 and found that (B) is used in an amount of 110 mol% of (A), (C) is used in an amount of 0.06 to 190 mol % of (A) (calculated based on the weight range of pyridine disclosed in Ely, discussed in paragraph 22), and (D) is used in an amount of 2.7 mol % of (S_yR³) repeating units in (B). The disclosed range of mol% of (C) overlaps the claimed range of 0.01 to 10 mol%. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 1911 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Response to Arguments

12. Applicant's arguments filed 03/09/2010 have been fully considered but they are not persuasive.

13. Applicants argue that both the Ely and Price references do not disclose the claimed invention because they disclose mercapto functional polysulfide polymers that are only partially reacted with silane groups. Applicants argue that at least 70% of the mercapto terminals in the polysulfide polymers remain unreacted with the silane

Art Unit: 1796

compounds. Applicants argue that this means the disilane functional polysulfide of the claims is not disclosed. This argument is not convincing. While Applicants' interpretation of the prior art is not incorrect, the disclosed processes of Ely and Price still read on the claims. The claims are directed to a method for the preparation of a disilane functional polysulfide, not to a composition *consisting* of the claimed disilane polysulfide. Any disclosed method that reads all the method steps and prepares some of the polymers of the claims, reads on the entire claim. The methods of Ely and Price in view of Ely disclose each of the reaction steps of the claims and produce a reaction product that will include a substantial portion of the disilane functional polysulfide of the claims. The terminal mercapto groups on the polysulfides of Ely and Price will react with the silane compounds at random. At least some of the polysulfide polymers will react with a silane compounds at each terminal end, resulting in the polymers of the claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIKE DOLLINGER whose telephone number is (571)270-5464. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1796

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/mmd/

/RANDY GULAKOWSKI/
Supervisory Patent Examiner, Art Unit 1796